CLAIMS

1) The hydrodesulfuration of hydrocarbon mixtures having boiling ranges within the range of C_4 to 250°C, containing olefins and at least 150 ppm of sulfur, with the contemporaneous skeleton isomerization of said olefins, which comprises putting these hydrocarbon mixtures in contact with hydrogen and with a catalytic composition comprising:

a) a carrier of an acid nature consisting of a silica and alumina gel, amorphous to X-rays, with a molar ratio SiO_2/Al_2O_3 of 30/1 to 500/1, having a surface area ranging from 500 to 1000 m^2/g, a porosity of 0.3 to 0.6 ml/g and a pore diameter within the range of 10-40 Å;

b) a mixture of metals belonging to groups VI B and VIII deposited on the carrier in an overall quantity ranging from 2 to 67% by weight with respect to the total of (a) + (b).

2) The process according to claim 1, wherein the acid carrier of the catalyst has a ratio SiO_2/Al_2O_3 ranging from 50/1 to 300/1 and a porosity of 0.4 to 0.5 ml/g.

3) The process according to claim 1, wherein the mixture of metals (b) consists of a metal of group VI B and a metal of group VIII.

4) The process according to claim 1 or 3, wherein the metal of group VI B is selected from molybdenum and tungsten, and the metal of group VIII is selected from cobalt and nickel.

5) The process according to claim 4, wherein the metal of group VI B is molybdenum and the metal of group VIII is cobalt.

6) The process according to claim 1 or 3, wherein the metal of group VI B is in a quantity ranging from 5 to 50% by weight with respect to the total of (a) + (b) and the metal of group VIII is in a quantity ranging from 0.5 to 10% by weight with respect to the total of (a) + (b).

7) The process according to claim 6, wherein the metal of group VI B is in a quantity ranging from 8 to 30% by weight and the metal of group VIII is in a quantity ranging from 1 to 5% by weight.

8) The process according to claim 1 or 3, wherein the molar ratio between the metal of group VIII and the metal of group VI B is less than or equal to 2.

9) The process according to claim 8, wherein the molar ratio is less than or equal to 1.

10) The process according to claim 1 or 3, wherein the silica and alumina gel carrier (a) is used in the form of an extruded product with a ligand.

11) The process according to claim 10, wherein the ligand is selected from aluminum oxide, bohemite and pseudobohemite.

12) The process according to claim 10, wherein the silica and alumina gel carrier (a) and the ligand are premixed in

weight ratios ranging from 30:70 and 90:10 and consolidated into the desired end-form.

13) The process according to claim 10, wherein the silica and alumina gel in extruded form is prepared as follows:

a) preparing an aqueous solution of a tetraalkylammonium hydroxide (TAA-OH), a soluble compound of aluminum capable of hydrolyzing in Al_2O_3 and a silicon compound capable of hydrolyzing in SiO_2, in the following molar ratios

SiO_2/Al_2O_3 from 30/1 to 500/1;

TAA-OH/SiO_2 from 0.05/1 to 0.2/1;

H_2O/SiO_2 from 5/1 to 40/1;

b) heating the solution thus obtained to cause hydrolysis and gelation and obtain a mixture A with a viscosity ranging from 0.01 to 100 Pa sec;

c) adding to the mixture A first a ligand belonging to the group of bohemites or pseudobohemites, in a weight ratio with the mixture A of 0.05 to 0.5, and then a mineral or organic acid in a quantity ranging from 0.5 to 8 g per 100 g of ligand;

d) mixing and heating the mixture obtained under point (c) to a temperature ranging from 40° to 90°C until a homogeneous paste is obtained, which is subjected to extrusion;

e) drying of the extruded product and calcination in an oxidating atmosphere.

14) The process according to claim 1, carried out at a tem-

perature ranging from 220°C to 360°C, at a pressure ranging from 5 to 20 kg/cm^2, at a WHSV ranging from 1 to 10 $hours^{-1}$ and with a quantity of hydrogen ranging from 100 to 500 times the quantity of hydrocarbons present (Nl/l).

15) The process according to claim 14, carried out at a temperature ranging from 250°C to 330°C, at a pressure ranging from 5 to 10 kg/cm^2, at a WHSV ranging from 2 to 6 $hours^{-1}$ and with a quantity of hydrogen ranging from 200 to 400 times the quantity of hydrocarbons present (Nl/l).

16) The process according to claim 1, wherein the hydrocarbon mixture which is subjected to desulfuration contains more than 600 ppm of sulfur.

17) The process according to claim 1, wherein the hydrocarbon mixtures which are subjected to hydrodesulfuration are mixtures having boiling ranges within the range of C_5 to 220°C.

18) The process according to claim 1, wherein the catalysts are activated by sulfidation.

19) A bifunctional catalyst comprising:

(a) a carrier of an acid nature consisting of a silica and alumina gel, amorphous to X-rays, with a molar ratio SiO_2/Al_2O_3 of 30/1 to 500/1, having a surface area ranging from 500 to 1000 m^2/g, a porosity of 0.3 to 0.6 ml/g and a pore diameter within the range of 10-40 Å;

b) a mixture of metals belonging to groups VI B and VIII de

posited on the carrier in an overall quantity which is greater than 50% and less than or equal to 67% by weight with respect to the total of (a) + (b).

20) The catalyst according to claim 19, containing a metal of group VI B in a quantity greater than 45% and less than or equal to 57% by weight with respect to the total of (a) + (b), and a metal of group VIII in a quantity ranging from 5 to 10% by weight with respect to the total of (a) + (b).

21) The catalyst according to claims 19 or 20, wherein the metal of group VI B is Mo and the metal of group VIII is Co.

22) A bifunctional catalyst containing:

(a) a carrier of an acid nature consisting of a silica and alumina gel, amorphous to X-rays, with a molar ratio SiO_2/Al_2O_3 of 30/1 to 500/1, having a surface area ranging from 500 to 1000 m^2/g, a porosity of 0.3 to 0.6 ml/g and a pore diameter within the range of 10-40 Å;

b) a mixture of cobalt and molybdenum deposited on the carrier in an overall quantity ranging from 2 to 50% by weight with respect to the total of (a) + (b).

23) A process for preparing the catalysts according to claim 19, which comprises:

i) wetting the silica and alumina gel, optionally in extruded form, with an aqueous solution of a compound of the metal of group VI B;

ii) drying the resulting product, and optionally calcining

it;

iii) impregnating the product obtained under point ii) with an aqueous solution of a compound of the metal of group VIII;

iv) drying the impregnated product obtained under point iii) and calcining it in an oxidating atmosphere at a temperature ranging from 200 to 600°C.

24) A process for preparing the catalysts according to claim 19, which comprises wetting the silica and alumina gel, optionally in extruded form, with an aqueous solution of a compound of a metal of group VI B and a compound of a metal of group VIII, drying the product thus obtained and calcining it in an oxidating atmosphere at a temperature ranging from 200 to 600°C.

25) A process for preparing the catalysts according to claim 22, which comprises:

i) wetting the silica and alumina gel, optionally in extruded form, with an aqueous solution of a compound of molybdenum;

ii) drying the resulting product, and optionally calcining it;

iii) impregnating the product obtained under point ii) with an aqueous solution of a compound of cobalt;

iv) drying the impregnated product obtained under point iii) and calcining it in an oxidating atmosphere at a tem-

perature ranging from 200 to 600°C.

26) A process for preparing the catalysts according to claim 22, which comprises wetting the silica and alumina gel, optionally in extruded form, with an aqueous solution of a compound of molybdenum and a compound of cobalt, drying the product thus obtained and calcining it in an oxidating atmosphere at a temperature ranging from 200 to 600°C.